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| Application No. | Ref. | Date |
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| Applicant: Nokia Corporation | | |

**Communication pursuant to Article 96(2) EPC**

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(1) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

**of 4 months**

from the notification of this communication, this period being computed in accordance with Rules 78(2) and 83(2) and (4) EPC.

One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (Rule 36(1) EPC).

**Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Article 96(3) EPC).**

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SCHWEITZER, J
Primary Examiner
for the Examining Division

Enclosure(s): 3 page/s reasons (Form 2906)

**Registered Letter**
EPO Form 2001 07.02CSX

The examination is being carried out on the **following application documents:**

**Description, Pages**
1-7 as published
**Claims, Numbers**
1-14 filed with telefax on 05.06.2006
**Drawings, Sheets**
1/3-3/3 as published

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The following documents (D) are referred to in this communication:
**D1 = WO-A-01/43473**
**D2 = GB-A-2 378 878**
**D3 = EP-A2-1 298 893**

Mobile telephones having an incline (tilt) sensor for detecting/measuring the inclination of the mobile telephone and for controlling the phone's display accordingly are already well-known from the cited prior art, in particular from document **D1**.

More specifically, referring to the wording of present **claim** 1, said prior art reference **D1** discloses a mobile cellular telephone, see page 3, line 5, comprising a display, a processor for controlling the operation of the mobile telephone including the display (see Fig.3) and an incline sensor (tilt meter 10; Fig.2) arranged to detect the inclination of the mobile telephone in (at least) a first plane, wherein the mobile telephone has an inclinometer mode, in which the processor receives an indication of the detected incline in the first plane from the incline sensor and controls the display to display an item (cursor) at a position dependent upon the received indication, see page 3, second and third paragraphs and claim 3 on page 13.

Claim 1 is thus entirely anticipated by the content of document **D1** and is hence not allowable in that it lacks novelty (Articles 52(1) and 54 EPC).

Furthermore, it is pointed out that should the applicant dispute the aforementioned novelty objection based on minor differences of interpretation between some of the

features of claim 1 and the features shown in **D1**, the subject-matter of claim 1 would at least not involve an inventive step (Articles 52(1) and 56 EPC), considering that **D1** aims at the same object, that is, using a mobile phone for measuring an inclination, as the present application.

In addition, reference is also made to the above-cited documents **D2** and **D3** which both teach the provision of incline or tilt sensors in mobile phones, see the abstracts. Although in **D2/D3** the detected "incline information" is apparently not directly displayed but is used to control the displayed image data, allowing e.g. the user of the phone to "navigate" around a displayed image or to scroll an image in accordance with the direction of tilt, see **D2**, page lines 17ff and **D3**, sections [0013] and [0014], it is nevertheless considered that to the skilled person starting from **D2** or **D3** and applying the knowledge and common sense expected of such, it would be rather evident that the mobile phone disclosed therein could also be used as a "digital water-level". Thus he would arrive at the subject-matter of claim 1 without performing any inventive step. Claim 1 is consequently also not allowable on this account (Articles 52(1) and 56 EPC).

The arguments concerning lack of novelty/inventive step set out above apply equally to independent **claim 11**, which additionally defines the provision of a second incline sensor for detecting inclination of the mobile phone in a second plane (as already disclosed in any of documents **D1** to **D3)** and to (newly filed) independent method **claim 14**. Claims 11 and 14 are therefore also not allowable for the reasons given above.

The **dependent claims 2 to 10 and "use claims" 12 and 13** appear to add nothing of inventive significance to claim 1, as the additional features introduced by said dependent claims refer only to minor implementing details which are either known or directly derivable from the cited prior art references **D1 or D2/D3**, e.g. the display in "real-time" of the measured/detected tilts in first and second orthogonal planes, or fall within the general knowledge or technical competence of a person skilled in the art, e.g. the features relating to the incline sensor itself, as defined in claim 10, each of said features acting in a normal and unsurprising way, and not combining to yield any unexpected or surprisingly advantageous result.

Thus, the dependent claims on file, either alone or in combination, appear to add nothing of inventive significance to claim 1 to which they are appended and, therefore, these claims cannot be considered to offer a basis for a patentable claim.

In view of the above, no allowable combination of claims can be suggested by the examiner. It is also not at present apparent which part of the application could serve as a basis for a new, allowable claim. If the applicant believes that such matter exists, he is invited to file a new set of claims directed towards such matter with strong supporting arguments detailing its inventive contribution to the art. However, as no feature of either the claims or the description appears to be a suitable basis for a new acceptable main claim, a refusal of the application should be expected.

If, despite the above objections, the applicant wishes to proceed with the application and submits new claims for consideration, he should also take account of the requirements of Article 84 EPC and Rule 29.2 EPC (number of independent claims, conciseness), Rule 29(1) EPC (two-part-form vis-a-vis **D1**), Rule 27(1)b)c) EPC (prior art discussion of **D1**, statement of the invention on pages 1 and 2), Rule 29(7) EPC (reference signs in claims) and, finally, Article 123(2) EPC (no addition of subject-matter).

The applicant should also clearly indicate in the letter of reply the difference vis-a-vis the state of the art and the significance thereof and, in order to expedite the procedure, indicate in his reply where there is a basis for the proposed amendments in the application as originally filed.

Finally, amendments to the application should be filed by way of replacement pages. If handwritten amendments are submitted, they should be clearly legible for the printer.

[0001] The invention relates to a freely portable radio receiver or transceiver in accordance with the preamble of claim 1.

[0002] Applications which run on a freely portable radio receiver or transceiver lose much of their convenience because they do not determine the position of the device in space and make suitable corrections to a screen display provided by an image display device. There are also applications which, for this reason, can not be run at all. This applies especially to applications in the consumer electronics field.

[0003] In the case of a navigation system in a vehicle, for example, the navigation system is linked to the vehicle and receives information on the direction of travel of the vehicle. On the basis of this information, the navigation system updates an image display provided by an image display unit which is part of the navigation system, including route information contained therein. Mobile navigation systems, on the other hand, have no such link. They do not require such a link because they make use of the so-called GPS (Global Positioning System).

[0004] The problem of the present invention is to specify a freely portable radio receiver or transceiver of the type described above, which is more convenient to use and which makes new applications possible.

[0005] This problem is solved according to the invention by a freely portable radio receiver or transceiver with the characterising features of claim 1.

[0006] Advantageous developments of the invention are the subject of dependent claims.

[0007] The problem is solved by the provision in the freely portable radio receiver or transceiver of sensors which determine changes in position in space of the relevant device in this case. In determining the position, this is output in the form of measured data as an analog and/or digital signal. This signal is fed to a controller through which an image display device provided in the relevant device in this case for the display of image content in an associated image display is induced to change the image content in the image display in a manner suitably adapted to the changes in position of the portable radio device involved here.

[0008] Here the term "sensors" should also be understood to cover the possible use of only one sensor which then effects all desired functions on its own.

[0009] An advantage of such a device according to the invention is that the output of image content is very much more convenient.

[0010] If for example town plans, maps, etc. are downloaded on to such a technical device, the map alignment has formerly been such that the north-south axis of the map shown coincided with the top-bottom axis of the device concerned. If the user was not facing north, then the alignment of the map section shown did not coincide with actual conditions. In the transfer of a route conceived on the map to the situation on the ground, difficulties could then arise because of the possible problems in imagining the map rotated to match the actual conditions. If on the other hand the device itself was rotated until the map displayed matched the actual situation, then it could be that street names were no longer easily readable. The device according to the invention is much more convenient to use in such situations because it has information concerning its position in space and is therefore able, irrespective of its current alignment, to make a suitable correction of the image content of the image display with reference to a point of the compass and a basic alignment. The device according to the invention is thus capable of making an adaptive adjustment of the image content of the image display. For example, in the case of continuous rotation of the device concerned here towards one point of the compass, the image content of the image display is in each case rotated back accordingly. In this way the user always has available in the present case a relevant map detail aligned correctly with respect to the actual situation. There is therefore for example no longer any problem in transferring a planned route to the situation on the ground.

[0011] If in an advantageous development of the invention for example the street names are additionally decoupled from a displayed map and linked to the alignment of the device concerned, then the street names could always be presented in a manner which was easy for the user of the relevant device to read, despite changes in position of the relevant device relative to a point of the compass, while the map or plan would always be shown in a manner coinciding with the actual alignment on the ground.

[0012] Another benefit of such a device according to the invention is that new applications are also possible.

[0013] Games such as e.g. motor racing may be played on the device according to the invention, with the device itself being the steering wheel. The device corrects the image content of the image display irrespective of its position in space, so that the game horizon is ultimately not rotated along with any impact on the steering wheel.

[0014] The device according to the invention may also provide an especially convenient navigation aid for the presentation of pages (e.g. internet pages, street plans and maps, plans, drawings, etc.) with geometrical dimensions extending beyond the area of the image display. The strength of the inclination may also be used to determine the speed at which the display should move over the page. Once the correct detail has been localised, then for example the process may be halted by releasing a navigation key (freezing the image detail), or a new navigation process may be initiated by pressing the key again.

[0015] In the field of computer games, figures in the games may now be navigated through their environment more realistically and eventfully than before. This is because the inclination and/or tilt sensors not only allow more refined directional guidance of the game figure (accurate to 0.1°), but also the strength of the inclination or tilt may be used to give it speed or power in addition. With a conventional 4-key joypad, a game figure could formerly be navigated within a moment of time only in one of the four directions of the compass (north, south, west, east). For a diagonal movement of the figure, the user therefore had to press the up/down and side keys alternately, leading to a zigzag movement of the figure.

[0016] The scope for determining the position of the device may also be used for navigation in the menu of the device. If the user wishes for example to search through a menu or list of names, then he need only tilt the device gently forwards or backwards for all menu items or names to pass through the image display. Once the user has found the relevant entry, then for example by a slight inclination of the device to the side, he may arrive at a subordinate function or vice-versa.

[0017] Another possible use of the device according to the invention is to guide the mouse pointer within a particular application, independently of the position.

[0018] There is also scope to use the position of the device as an additional decision criterion for maintaining a confidence level for information shown pictorially. This is to be seen against the background of future freely portable radio devices which are

intelligent and capable of learning. In the first step, for example, automatic deactivation of the image display could take place if the freely portable radio device was held in such a way that, in the normal situation, no display would be required.

[0019] Also in the future, the devices concerned will be expanded by numerous applications, the operation or handling of which will be simplified in many respects by the introduction of the new communications interface. However not only is the simplification of operation of benefit, but also the "joy of use" aspect, which is an increasingly important selection criterion for the user.

[0020] Relevant devices may be for example terminals for radio communication, as realised by mobile phones.

[0021] Capacitive inclination and/or tilt sensors are cost-effective but nevertheless accurate and non-wearing sensors which operate using a novel measuring process. These inclination sensors detect inclinations between +/-30° in all directions (360°) to an accuracy of 0.1°. Because of the analog or digital signal output, further processing of the signal presents no problem whatsoever. Inclination or tilt sensors are already available in miniaturised form and may therefore also be integrated in even the smallest terminal equipment.

[0022] Embodiments of the invention are explained in detail below with the aid of a drawing, which shows in:

| | |
|---|---|
| Figure 1 | an embodiment of a freely portable radio receiver or transceiver according to the invention |
| Figures 2A and 2B | a device according to Figure 1 in different positions relative to various points of the compass |
| Figures 3A and 3B | a device according to Figure 1 in different positions relative to various directions of inclination, and |
| Figures 4A and 4B | a device according to Figure 1 in different positions relative to various directions of tilt. |

[0023] The freely portable radio receiver or transceiver 1 shown in Figure 1 is in the form of a mobile phone. Amongst other things it has an image display device 2 with an

image display 3. The image display 3 makes possible the display of image content, visible externally, which may be either received by radio or self-generated.

[0024] The freely portable radio receiver or transceiver 1 according to Figure 1 also has sensors 4, 5, 6 of various types or performing different functions. The sensors 4, 5, 6 are used to determine the position in space, starting from a fixed neutral position. In respect of a point of the compass, orientation towards the north may be defined as the neutral position. With respect to lateral inclination, an inclination of 0° may be defined. In respect of tilting around a transverse axis of the device, a 45 degree setting may be defined as the neutral position.

[0025] To determine the change in position from the neutral position of the device 1 involved here the device 1 has, as a first part of the different or different types of sensor 4, 5, 6, sensors 4 which are able to determine the change in position relative to a point of the compass. As a second part of the different or different types of sensor 4, 5, 6, the device 1 involved here has sensors 5 which are able to determine the change in position relative to sideways movement to left or right. Finally the device 1 involved here has, as a third part of the different or different types of sensor 4, 5, 6, sensors 6 which are able to determine the change in position relative to tilting around a transverse axis of the relevant device 1.

[0026] At this point it may be noted that not all types of sensor need be provided on each case in the device 1 involved here. Depending on the intended functions of the device 1 involved here, the device 1 concerned may be equipped for example with only the sensors 4 belonging to the first part, or only with the sensors 5 and 6 belonging to the second and/or third parts.

[0027] As shown in Figure 1, the device 1 has a switching device 7, by means of which the adjustment of the display of image content in the image display 3 may be made operative or inoperative depending on the changes in position of the device 1 involved here.

[0028] The different or different types of sensors 4, 5, 6 are connected to a controller 8, which in turn is connected to the image display device 2.

[0029] The controller 8 operates on the basis of the changes in position of the device 1 involved here, as determined by the different or different types of sensors 4, 5, 6.

Depending on the changes in position of the device 1 involved here, the different or different types of sensors 4, 5, 6 in each case generate suitable control signals in digital and/or analog form, which are processed by the controller 8. On the basis of these control signal the controller 8 then induces the image display device 2 to display suitably revised image content in the image display 3.

[0030] Figures 2A to 4B show the form in which the image content of the image display 3 is changed by the image display device 2.

[0031] In Figures 2A and 2B, starting from a north-south direction as indicated by a compass rose (9), the freely portable radio device 1 is rotated as shown in Figure 1 around an angle $\alpha$ in a north-westerly compass direction (Figure 2A) or around an angle $\beta$ in a north-easterly compass direction (Figure 2B). The image content of the image display 3 is at the same time in each case rotated back around a corresponding identical angle $\alpha$ or $\beta$, so that ultimately the image content of the image display 3 remains aligned constantly in the north-south direction.

[0032] In Figures 3A and 3B, the freely portable radio device (1) is inclined to the side, to the left (Figure 3A) or to the right (Figure 3B). At the same time the image display 3 of the image display device 2 shows in each case a detail of a larger image content, which can however not be shown to the full extent in the image display 3 of the image display device 2. In the event of a lateral inclination to left or right, the image detail displayed by the image display 3 is shifted in the direction of the relevant lateral inclination. Here the speed of the shift depends on the degree of lateral inclination.

[0033] In Figures 4A and 4B, the freely portable radio device (1) is tilted upwards (Figure 4A) or downwards (Figure 4B) around a transverse axis At the same time the image display 3 of the image display device 2 again shows in each case a detail of a larger image, which can however again not be shown to the full extent in the image display 3 of the image display device 2. In the event of tilting upwards around the transverse axis or downwards around the transverse axis, the image detail displayed by the image display 3 is shifted in the direction in which the tilting has taken place. Here again the speed of the shift depends on the degree of tilting.

[0034] It is possible to link a switching function to the degree of tilting or inclination. For example if the inclination or tilting was too severe, the image display could be

switched off. A reason for this could be that the image display could not be seen from an adjacent location. A switching function could also be activated if inclination or tilting takes place only briefly in one direction.

[0035] In general it applies that rotation, inclination or tilting need not take place alone at a single moment in time, but that combinations may also occur.

**Patent claims**

1. Freely portable radio receiver or transceiver with an image display device for the display of image content in an associated image display, **characterised in that** there are provided sensors (4, 5, 6) which determine changes in position of the freely portable radio device (1) in this case, and that there is provided a controller (8) operating on the basis of one of the determined changes in position of the freely portable radio device (1) and which induces the image display device (2) to change the image content of the image display (3) in a manner suitably adapted to one of the changes in position of the freely portable radio device (1) involved here.

2. Freely portable radio device according to claim 1, **characterised in that** the sensors (4, 5, 6) comprise sensors (4) forming a first part and which are sensitive to alignment towards one point of the compass, and which display the extent of a change in position of the freely portable radio device (1) involved here on the basis of the alignment towards one point of the compass in a manner which may be technically further processed, and that the adapted change in the display of image content effected by the image display device (2) is in the form of a corresponding turning back of at least parts of the displayed image content.

3. Freely portable radio device according to claim 2, **characterised in that** the sensors (4) comprise compass elements.

4. Freely portable radio device according to any of the preceding claims, **characterised in that** the sensors (4, 5, 6) comprise inclination or tilt sensors (5 and 6 respectively)

forming a second or third part by means of which changes in position, due to inclination or tilting, of the freely portable radio device (1) involved here are determined, and any determined inclination or tilting is displayed in a manner suitable for further technical processing.

5. Freely portable radio device according to claim 4, **characterised in that** any determined inclination or tilting is displayed in a manner suitable for further technical processing such that information regarding the degree of tilting or inclination may be obtained at least technically from this display.

6. Freely portable radio device according to claim 4 or 5, **characterised in that** the change of image content in the image display (3) effected by the image display device (2) is realised as a shifting of the display of the relevant image content in the direction of the tilting or inclination of the freely portable radio device (1) involved here.

7. Freely portable radio device according to claim 6, **characterised in that** a speed of shifting associated with the shift in the image display (3) of image content is made dependent on the degree of tilting or inclination of the freely portable radio device (1).

8. Freely portable radio device according to any of claims 4 to 7 **characterised in that**, dependent on the sole or joint occurrence of tilting and/or inclination or dependent on the sole or joint occurrence of tilting and/or inclination in each case beyond a preset amount, switching processes are triggered in the freely portable radio device (1) involved here.

9. Freely portable radio device according to claim 8 **characterised in that**, after inclination or tilting of the freely portable radio device (1) involved here beyond a preset amount, a switching process is triggered by means of which at least the image display (3) of the image display device (2) is switched off.

10. Freely portable radio device according to any of the preceding claims, **characterised in that** a switching device (7) is provided to make operative the adjustment of image content in the image display (3).

11. Freely portable radio device according to any of the preceding claims, **characterised in that** the freely portable radio device (1) is in the form of a mobile phone.